

**S. Michael Angel, Professor**  
**Department of Chemistry & Biochemistry**  
**The University of South Carolina**  
**Columbia, SC 29208**

Professional Preparation:

North Carolina State University, Raleigh, NC, Chemistry, B.S., 1979

North Carolina State University, Raleigh, NC, Analytical Chemistry, Ph.D., 1984

Lawrence Livermore National Laboratory, Livermore, CA, Spectroscopy (Postdoc), 1985-1986

Appointments:

Fred M. Weissman Palmetto Chair in Chemical Ecology, Department of Chemistry and Biochemistry, The University of South Carolina, Columbia, SC 29208, August 2004 - Present  
Carolina Trustee Professor, 2013-present.

Professor of Chemistry, Department of Chemistry and Biochemistry, The University of South Carolina, Columbia, SC 29208, May 2001 - Present

Associate Professor of Chemistry, Department of Chemistry and Biochemistry, The University of South Carolina, Columbia, SC 29208, August 1993 – May 2001

Group Leader-Advanced Measurement Sciences Group, Environmental Sciences Division, Lawrence Livermore National Laboratory, Livermore, CA, 1989 - Aug. 1993

Environmental Scientist, Environmental Sciences Division, Lawrence Livermore National Laboratory, Livermore, CA, September 1986 - 1989

RELEVANT PUBLICATIONS (5)

1. "Transmission Raman Measurements using a Spatial Heterodyne Raman Spectrometer (SHRS)," K. A. Strange, K. C. Paul, S. M. Angel. *Appl. Spectrosc.*, In Press 2016. DOI: 10.1177/0003702816654156.
2. "Miniature Spatial Heterodyne Raman Spectrometer with a Cell Phone Camera Detector," Patrick D. Barnett and S. Michael Angel, *Appl Spectrosc.* 2016 Aug 29, DOI: 10.1177/0003702816665127.
3. "Deep-Ultraviolet Raman Measurements Using a Spatial Heterodyne Raman Spectrometer (SHRS)," Nirmal Lamsal and S. Michael Angel, *Applied Spectroscopy*, accelerated article, **69**, 525-534 (2015). DOI: 10.1366/14-07844.
4. "Stand-off UV and Visible Raman Measurements Using a Gated Spatial Heterodyne Raman Spectrometer," N. Lamsal, S. K. Sharma, T. E. Acosta, S. M. Angel. *Appl. Spectrosc.* 2016. 70(4): 666-675.
5. "Performance Assessment of a Plate Beam Splitter for Deep-UV Raman Measurements with a Spatial Heterodyne Raman Spectrometer," Nirmal Lamsal and S. M. Angel, *Appl. Spectrosc.* 2016. DOI: <https://doi.org/10.1177/0003702816678869>.

OTHER SIGNIFICANT PUBLICATIONS (5)

1. "Improving Spectral Results through Row-by-Row Fourier Transform of Spatial Heterodyne Raman Spectrometer Interferogram," Patrick Barnett and S. M. Angel, *Appl. Spectrosc.*, published 2016, DOI: 10.1177/0003702816681013.
2. "Standoff LIBS using a Miniature Wide Field of View Spatial Heterodyne Spectrometer with Sub-Microsteradian Collection Optics," Patrick D. Barnett, N. Lamsal, S. M. Angel. *Appl. Spectrosc.* LIBS Special Issue, DOI: 10.1177/0003702816687569.

3. "Remote Raman Spectroscopy for Planetary Exploration: A Review," S. Michael Angel, Shiv K. Sharma, Nathaniel R. Gomer, and Chris McKay, *Appl. Spectrosc.*, 66, 137-150 (2012).
4. "Raman Spectroscopy Using a Spatial Heterodyne Spectrometer: Proof of Concept," Nathaniel R. Gomer, Christopher M. Gordon, Paul Lucey, Shiv K. Sharma, J. Chance Carter and S. Michael Angel, *Appl. Spectrosc.*, **65** 34-42 (2011).
5. "Stand-off SERS and SERRS detection in the presence of ambient light," J. Scaffidi, M.K. Gregas, B. Lauly, J.C. Carter, S.M. Angel and T. Vo-Dinh, *Applied Spectroscopy* **64**, 485-492 (2010).

#### SYNERGISTIC ACTIVITIES:

- STEM teaching and training by writing undergraduate laboratories that are based on our research and bringing students into the research lab as part of the teaching experience, led to USC's 2015 Mungo graduate teaching award and 2011-2012 Mortar Board "*Excellence in Teaching*" Award.
- Service to the scientific community through >140 publications, 6 book chapters, dozens of conference proceedings, and serving on the SuperCam science team for NASA's Mars 2020 Mars Lander mission. Led to election as SAS Fellow in 2016, in 2011 to election as Fellow of AAAS and 2015 Southern Chemist Award.
- Service to the academic community as a previous A-Page Advisory Panel Member for *Analytical Chemistry* and member of the Advisory board of *TALANTA*; Editorial Board Member of International Journal of Spectroscopy (2009-2014); and International Scientific Committee Member NASLIBS, as well as serving as a 2105, 2013 & 2007 Tour Speaker for the Society of Applied Spectroscopy.
- Broadening the participation of underrepresented groups in science by including many minority undergraduates and women in the research group including visiting students from Europe.
- Bringing high school teachers into the laboratory and visiting local schools to talk about what we do as chemists. Led in part to 2012 ACS South Carolina *Chemist of the Year Award*.